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ABSTRACT

This paper describes the change in student attitudes after taking a computer literacy course which is part of a 6-week pre-college summer session. The summer session is designed for the educationally and financially disadvantages students of the Higher Education Opportunity Program (HEOP) and students from the ACCESS program who do not meet normal admissions criteria. The computer literacy course is taught in a Macintosh teaching lab, to classes of 12 to 14 students. The aim is to teach students how to use computers for all their coursework and to encourage students to be comfortable using technology. The course syllabus includes units on Microsoft Word, SuperPaint, the Internet, and HyperCard. To obtain a qualitative assessment of whether the course was meeting its objectives, a survey was distributed at both the beginning and the end of one summer session, asking students to rank their attitudes towards using computers on a scale of one to five, from completely disagree to completely agree. The overall change in student attitudes shows that students learn content and are more confident when they develop computer applications where they can implement their own ideas. (SWC)

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Paper

Assessing Change after a Computer Course for At-Risk Students

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Abstract

In this paper, I plan to describe a computer literacy course that I teach as part of a Pre-freshman summer session for at-risk students. The aims of the course are to teach students how to use computers for all their coursework and to encourage students to be comfortable using technology. I surveyed students on their attitude towards computers both before and after the course to see whether the course succeeded in achieving its goals.

The Pre-freshman Summer Program is a six-week intensive summer session for certain incoming freshman. These entering students are either in HEOP (Higher Education

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Opportunity Program) or ACCESS. HEOP is a New York State funded program for educationally and financially disadvantaged students. ACCESS is a special admissions program at the College of Saint Rose for students who do not meet the normal admissions criteria. Students in both programs must attend the summer program. All students in ACCESS and HEOP are regarded as at-risk students, and they are given special attention to help them achieve their goal of a college degree.

During the summer program, students take remedial courses in mathematics and English, take a course on study skills, have individual and group counseling, have mandatory tutoring sessions, and have structured study periods. They also take a computer course.

The computer course meets five days a week for 55 minutes for six weeks. The class meets in a Macintosh teaching lab so that students can use a computer during each class. We keep the class size deliberately small so the instructor has time to work individually with students. Usually there are between twelve and fourteen students in the class. The aims of the course are to teach students how to use computers for all their coursework and to encourage students to be comfortable using technology. The hope is that students will regularly use computers for all their classes until they graduate.

I have taught this course for the past four years. In the first year, I taught students how to use the standard business applications—word processing, spreadsheets, and database. I also taught students how to use a drawing program and there was a small unit on *HyperCard* at the end of the semester.

HyperCard is an authoring program that lets people with minimal programming skills create multimedia applications. All *HyperCard* applications are like a stack of index cards. Each "card" is a screen. The designer can place graphics and text fields on cards. The designer can also put buttons on cards. Buttons can start animation sequences, play programmed music, and play back recorded sounds. Buttons can also connect to other cards to create hypertext documents. *HyperCard* is a Macintosh program, but there is a similar program called *ToolBook* for the IBM platform.

Students enjoyed learning how to do word-processing since this task is obviously important for any college student. The spreadsheet and database programs did not interest the students as much, since these applications seemed irrelevant to them. *HyperCard* interested them greatly. Unfortunately, due to time constraints, students developed a very small project under my close direction. Each student project was the same.

I made a few changes during the second summer I taught the course. I still taught students how to do word processing, but I replaced the business applications software with *MacSolve*. *MacSolve* is a program that supposedly teaches problem-solving and critical-thinking skills. Unfortunately, we found that there were serious bugs in the program. Even without bugs, the programming language syntax in the package was difficult for students to grasp. Students had many problems using *MacSolve*, and were starting to think that computers were hard to use!

Since using *MacSolve* was so counter-productive, I abandoned it earlier than I had planned. This left more time available for an expanded unit on *HyperCard*. In the first week of this unit, I guided students as they created a geography project on the United States. The first card of the stack had a map on it. By clicking a button on top of a state, a card with information about that state would appear. During the class, I guided students as they created this stack. Students also had a handout I wrote that they could use on their own.

In the second week, I asked students to design and implement their own stacks. I encouraged students to experiment. Students added animation sequences, PICT files created using *SuperPaint*, scanned artwork and recorded sounds to their stack. The work

5. If I took a computer class in college, I would expect to get an "A."	3.29	3.81	0.53
6. If I took a computer class in college, I would expect to fail it.	1.89	1.37	0.52
7. I am planning on taking at least one computer course while in college.	4.68	4.63	0.05
8. I have taken at least one computer class in high school.	4.29	4.33	0.05
9. I am scared of computers.	2.04	2.15	0.11
10. Computers are easy to use.	2.79	3.48	0.70
11. People like me find computers hard to use.	2.71	2.07	0.64
12. People like me enjoy using computers.	3.71	3.74	0.03
13. I have a computer in my home.	3.14	3.30	0.15
14. Learning about computers is important for my future.	4.82	4.74	0.08
15. I am comfortable learning new things about computers.	4.29	4.41	0.12
16. I can use computers in a creative way.	3.36	4.22	0.87
17. People like me don't take computer classes in college.	1.54	1.74	0.21
18. People like me enjoy learning new things.	4.50	4.48	0.02
19. Using a computer hinders creativity.	2.29	2.04	0.25
20. Knowing how to use a computer will help me get better grades.	4.39	4.44	0.05
21. I hate computers.	1.68	1.74	0.06
22. Only social misfits like using computers.	1.11	1.41	0.30
23. I am good at organizing projects.	3.11	3.59	0.49
24. I would expect to get an "A" in most of my college classes.	3.29	3.37	0.08

fully engaged all students. Students liked using the different peripheral devices, and many students spent much time outside class getting their projects to work. Students especially liked implementing their own ideas. On the last day of class, there was a "show-and-tell" session, so students could try out all projects. I was very happy that students were so independent and were so comfortable using computers to do new tasks.

"See Dick" was the title of the best project that summer. The project's goal was to teach the danger of alcohol and drugs. There were animation sequences that included people drinking from funnels, people smoking marijuana, and people driving cars into trees.

Since using *HyperCard* was such a success, I have had students design and implement their own projects during the past two summers. My syllabus now includes units on *Microsoft Word*, *SuperPaint*, using the Internet, and *HyperCard*.

The Internet unit is fairly brief. I teach students how to send and receive e-mail, and how to access information using gopher. Last summer was the first semester students used the Internet, and this unit was very popular. Again, students felt very comfortable using technology in a new way.

This past summer, "Broadway Musicals" and "Name The Artist" were the titles of the two best projects. The "Broadway Musicals" stack had an index on its first card. By clicking the name of a Broadway show, the user would go to a card about that show. Each card had a scanned picture from the show's CD cover, a text field that gave a synopsis of the plot, and a button that would play back a song from the show. Each card also had a button that could take the user back to the first card.

The "Name The Artist" stack had a series of cards with questions. Each card had a scanned photograph of a painting or sculpture. The user could click the name of the artist. If the user guessed correctly or incorrectly, they would get a visual response and a musical response. After a correct guess, the next question card would appear. In my classes, trivia games are a fairly common project. What made this stack so special was the care that the student took in designing each card.

I certainly felt that the course was meeting its goals, but I thought it would be useful to assess whether this was true. On the first day of the summer session, I gave students a questionnaire that would test their attitudes on using computers. I also gave the same questionnaire to the students on the last day of the summer session. It was my hope that the course would positively change student attitudes.

The following table contains the survey statements and the mean response. I asked students to answer each statement with 5 if they completely agree, 4 if they somewhat agree, 3 if they neither agree nor disagree, 2 if they somewhat agree and 1 if they completely disagree.

	Initial Response	Final Response	Change
1. It is easy to break a computer.	3.39	3.63	0.24
2. I know a lot about computers.	2.36	3.19	0.83
3. I know how to write a paper using a computer.	3.82	4.63	0.81
4. I know how to draw using a computer.	2.79	4.56	1.77

The mean change per statement is .37, and the standard deviation of the change per statement is .41. I grouped the statements into three categories. The first category of minimal change included those statements with an average change per statement under .37. This group included statements 1, 7, 8, 9, 12, 13, 14, 15, 17, 18, 19, 20, 21, 22, and 24. Of this group, statements 7, 8, 14, 17, 18, 20, 21, and 22 already had a fairly extreme response (either over 4.0 or under 2.0) initially, so attitudes could not change greatly for those statements. For example, the mean response to statement 14 (Learning about computer is important to my future.) was initially 4.82. It could not become much higher!

It is interesting that there was not much change in response to statements 1 (It is easy to break a computer.), 9 (I am scared of computers.), 12 (People like me enjoy using computers.), 15 (I am comfortable learning new things about computers.), 19 (Using a computer hinders creativity.), and 24 (I would expect to get an "A" in most of my college classes.).

The second category of moderate change included those statements with an average change per statement between .37 and .78. Statements in this category included statements 5 (If I took a computer class in college, I would expect to get an "A."), 6 (If I took a computer class in college, I would expect to fail it.), 10 (Computers are easy to use.), 11 (People like me find computers hard to use.), and 23 (I am good at organizing projects.). The first four statements in this group all relate to confidence. Students are clearly more confident using computers than they were before the semester started. It is interesting that the mean for statements 5 (If I took a computer class in college, I would expect to get an "A.") and 24 (I would expect to get an "A" in most of my college courses.) were both 3.29 before the semester started, but were 3.81 and 3.37 respectively after the summer session was over. Students clearly are more confident they will do well in a computer course than they would do in a different course.

The third category of high change included those statements with an average change per statement over .78. Statements in this category included statements 2 (I know a lot about computers.), 3 (I know how to write a paper using a computer.), 4 (I know how to draw using a computer.), and 16 (I can use computers in a creative way.). Statements 2, 3, and 4 are responses to content learning during the semester.

The change in mean response to statement 16 pleases me greatly. This response shows that students view using a computer in a very different light. The response to statement 16 clearly echoes the observation I made in the past that students love to blend graphics, sound, and animation while implementing their own ideas.

The overall change in student attitudes reinforces my belief that students learn content and are more confident when they develop computer applications where they can implement their own ideas. *HyperCard* and *ToolBook* are ideal applications for "computer literacy" courses since these programs let students easily blend sound, graphics, animation, and text.